

ATTR Syntax: Attr filename [permissions] Usage : Examine or change the security permissions of a file Opts: -perm = turn off specified permission perm= turn on specified permission -a = inhibit s - no to own pw - Syntax one de single Basic0 filename CHD S specific

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directory to specified path CMP Syntax: Cmp filename1 filename2 Usage : File comparison utility COBBLER Syntax: Cobbler devname Usage : Creates OS-9 bootstrap file from current boot CONFIG Syntax: Config Usage: Create system bootstrap and system disks COPY

Syntax one file Date [t specify : Check for wor = save cluster print {<devn filename delete directo [e] [x] names executi

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data from E Syntax : Opts: t = ame> Usage directory asters -m of unused nly -o = <devname> : Del [-x] s : -x = x: Deldir Syntax: Dir the file ry x=print] Usage :

Display s converted characters to standard output DSAVE Syntax : Dsave [-opts] [dev] [pathname] Usage : Generates procedure file to copy all files in a directory system Opts : -b make a system disk by using OS9boot if present -b=<path> = make system disk using path as source i = indent for directory levels l = do not process b command ECHO Syn output ED text edito

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error messages for given error numbers EX Syntax: ex <modname> Usage: Chain to the given module FORMAT Syntax : Format <devname> Usage : Initializes an OS-9 diskette Opts ; R - Ready L - Logical format only "disk name" 1/2 number of sides 'No of

AUSTRALIAN OS9 NEWSLETTER
Newsletter of the National OS9 User Group
Volume 4 Number 5

EDITOR : Gordon Bentzen

HELPERS : Bob Devries and Don Berrie

SUPPORT : Brisbane OS9 Level 2 User Group.



Things are certainly starting to happen in the OS9 World!

Firstly, we (that is, the Australian OS9 Users Group) have finally been able to establish links with a number of reliable overseas sources of Public Domain Software. We have managed to establish links to a couple of guys in the Netherlands who are willing to provide us with as much material as we require from their collections, and also from the collection of the European OS9 Users Group. Some 50 megabytes (yes megabytes) of PD software. We have also managed to get access to the Princeton University (USA) OS9 Group Listserver on Internet, and can send and receive messages and files via that forum. Some very familiar (in the OS9 Community) names are regular contributors to the discussions on that network. Such names as Kevin Darling, Mike Knudsen, Tim Koonce and Mark Griffith are common correspondents. And the material that they are currently discussing is always 'state of the art' OS9.

Secondly, we have seen the first CoCo4 'clone' released in the form of the 'TC9 TomCat' from Frank Hogg Laboratories Inc. The documentation that we have seen will make all OS9 Users' mouths water (even the OSK types). I will try to give a synopsis of the documentation just to whet your appetite. Incidentally, this description should not be taken as any kind of endorsement for the product. As usual, we are simply providing information about OS9 and OS9 related products.

Let me quote from the advertising flier that I received in the mail:

From 6809 to 68030 and beyond, with your present hardware, at your own pace...

Here are some of the specifications for the TC9; 25% faster than a CoCo3, uses a PC compatible keyboard, has 2 'real' serial ports, supports a serial mouse, has a parallel printer port, has provision for 512K onboard ram, OR can use a CoCo 3 512K ram upgrade, can be upgraded to 1 megabyte with the Disto 1 meg upgrade with no soldering, has 8 bit A to D and D to A converters, providing better sound and higher resolution joystick, supports an internal speaker, has a standard CoCo bus so that existing cartridges can be used, and is K-Bus compatible!!

K-Bus is FHL's standard OSK vehicle, and has been advertised in publications such as the US Rainbow Magazine. What is interesting, is that the TC9 does not have to be used with a K-Bus system, but can be used (with the addition of a case and power supply) as a stand alone CoCo3 clone. We are presuming that the system is based on the Hitachi high-speed 6809 look alike chip. This means that everything simply runs faster than it would on a CoCo3, but with very few other changes. Interesting things start to happen when a K-Bus system is added. With the addition of a K-Bus system, interfacing to a 68000 (or even a 68030) is simple, and the Tomcat then becomes a dual processing system. This means that when in OS9 Level II mode, the 680X0 chip becomes a co-processor!! This should mean a 2 to 3 fold improvement in performance. When the 680X0 is master, the TC9 will act as a co-processor to OSK. Theoretically, this should make for a smooth transition between OS9 and OSK. And of course, as soon as a K-Bus system is fitted to the TC9, all of the K-Bus peripherals become available for use with the system.

The price? US\$ 299.95. But, you would have to add to that a case, keyboard and power supply just to get the thing going as a (fast) CoCo. I'm not sure that I will be racing to buy one at that sort of price!!

The release of the second 'clone' machine, the MM1 is imminent, and there is rumour of even a third clone machine in the not too distant future. So, as I said, things are really starting to happen.

I hope you enjoy this copy of the Newsletter. Cheers Gordon.

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CREATING A BOOT DISK

An addendum to "OS-9 From The Beginning"

Last month's Newsletter contained an excellent Article "OS-9 From The Beginning". During a discussion with Gordon it was agreed, as an addendum to OS-9 From The Beginning, that I should write an article on setting up a Boot Disk.

Only what is contained on the original System Disks will be used to create a Boot Disk to maximise your system. We will also be setting up a disk from which you can easily create other Boot Disks when required.

The MODPATCH utility will be used in modifying the System, so a simple explanation in its use will also be given. There will also be a chart detailing the Disk Drive Offset locations and the patches for those locations. The windows I will not cover here as I have already done so in the Dec 89 - Jan 90 Newsletter (page 6).

Having spent a couple of nights prior to writing this article attempting to operate a one drive system, I have decided that the first requirement of a one drive system is a second drive. A two drive system will be assumed.

I am assuming you have booted your system with a backup copy of your original disk. You will have a system that is 35 tracks single sided with a step rate of 30ms, also a 32 column screen, at this point there is little we can do about the screen as GrfDrv is not in memory. What we can do is take a look at the changes that can be made to the drive descriptors. Study the chart below: You should find it self explanatory.

Offset	13	14	16	18	19	22
Drive accessed /D0	00					
/DD	00					
/D1	01					
/D2	02					
Step rate	30ms	00				
	20ms	01				
	12ms	02				
	6ms	03				
Density	35trk		01			
	40trk		01			
	80trk		03			
No of Tracks	35trks			23		
	40trks			26		
	80trks			50		
No of Sides	1				01	
	2				02	
Drive Name	/D0					B0
	/DD					C4
	/D1					B1
	/D2					B2

This is where we learn how to use MODPATCH and in doing so put the finishing touches to your understanding of the above chart.

MODPATCH allows you to link to a module, and change an Offset address in that module from one value to another, in this case it is going to be D1, Why ?, because we need to format a 40trk double sided disk, and to do that we need a 40trk double sided descriptor in memory. We will leave D0 and DD remain as they are for now with the exception of the step rate. Most drives today can handle the 6ms stepping rate so I will be using that as an example. If your drives are different then choose the right value from the above chart, If you do not know try experimenting with just the step rate. The changes wont become permanent until you use the CORBLER command.

How do we do this? At the command line type MODPATCH <enter>. When MODPATCH loads, the cursor will be hard against the left side of the screen. Press <1> (that's a lower-case L) then the <space bar>. Then type "D1" (the

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module we are linking to.) Then press <enter>. You will notice that everything you type echoes, don't worry, this is normal. To change anything, first locate from the chart, the offset that needs to be changed. As I said in the previous paragraph, I will change the step rate to 6ms. The offset for this, from the chart, is 14. The step rate of the original disk is 30ms, its value is 00. The 6ms value is 03. What we have to do now is to change the value at offset 14 from 00 to 03. What you have to remember is, that you change an offset FROM what it is, TO what you want it to be.

It should go like this....I won't show the echo.

```
modpatch <enter>
l d1 <enter>
c 14 00 03 <enter> *The step rate from 30ms to 6ms
c 18 23 28 <enter> *Tracks from 35 to 40
c 19 01 02 <enter> *Sides from 1 to 2
v <enter>          *verify the changes
l d0 <enter>       *Link to D0
c 14 00 03 <enter> *The step rate from 30ms to 6ms
v <enter>          *verify the changes
l dd <enter>       *Link to DD
c 14 00 03 <enter> *the step rate from 30ms to 6ms
v <enter>          *verify the changes
<Control-Break>   *Exits from modpatch back to OS9 prompt.
```

Try a few commands to test out your new found speed. Put a blank disk in /d1 and type format /d1 r "40 Track D/SIDE". When the formatting is finished, a "free /d1" command will reveal 1440 sectors, a little better than the 630 sectors you originally had on your system disk.

When everything is working satisfactorily, the number of tracks and sides for the D0 and DD descriptors can then also be changed. At this point the only changes that have been made, are in memory, and not on the system disk in /d0, or the newly formatted 40 track double sided disk in /d1.

If you are satisfied with the modules you have in memory, make the changes to D0 and DD. You will also want your BOOT stepping at 6ms, so make this change also.

```
l boot <enter>
c 017c 13 10 <enter>
v <enter>
<Control-Break>
```

Now do a cobbler /d1 <enter>. This will put an OS9Boot file on the disk in /d1 which will include all the changes we have just made. To make this a system disk we need to copy all the files from the disk in /d0 to the new disk in /d1. There is a utility called DSAVE, in the CMDS directory that we can use for this. This is how it is done....

```
chd /d0 <enter>
dsave /d0 /d1 ! shell <enter>
```

Now sit back and watch a new system disk being created, or have a cup of coffee.

This is the end for this month, next month I will be showing you how to create your own config procedure, that once completed will allow you to build your own boot disk, in a fraction of the time that config takes.

If you have any queries please call or write.....Rob Unsworth
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Ipswich QLD 4305.

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The following article was sent to us by Peter Tutelaers of the Netherlands OS9 Users Group. By kind permission of the authors, (although we are not strictly an electronic medium) we reproduce it here for your education. I guess that it becomes fairly technical in its treatment of the famous (or infamous, depending on your viewpoint) Root Order Bug, and therefore will not be a great deal of use for all of our members. Ed.

COCO-3 BOOT LIST ORDER BUG (BLOB)

Facts, fixes and theories

Kevin Darling & friends

The BLOB! Some owners have it, some have never seen it. Ordering of modules in a bootlist for os9gen seems to affect it. Adding new devices may cause it to show up. What causes it? It's past time to lay out both what has been conjectured and what is truly known so far.

At first, the OS-9 kernel itself was blamed. We've been pretty sure now for a long time that it is NOT at fault. All the modules are position-independent, and have been gone over very closely by several of us, looking for anything that could cause a problem. We have found no software cause at all (with the exception of the disk driver - see below). Instead, hardware and timing discrepancies in the CoCo-3 and peripherals have been found almost always to be at fault. In fact, it's often possible to pinpoint the exact cause of a particular problem, with enough information.

Enough preliminaries. Here are most of the confirmed and unconfirmed symptoms and possible reasons, including things that act like BLOBs...

FLOPPY FORMATTING HALTS IN FIRST FEW TRACKS; READ/Writes ARE OFF BY A BYTE:

Ken Schunk, myself, and others long ago found that the halt method used by CC3Disk (and some RSDOS drivers in programs) has a problem with some disk controllers (apparently mostly pre-1985 1773's). The usual method is to wait for the FDC (floppy disk controller) to indicate it is ready to exchange a byte of data, and then have the CoCo go into the halt mode. What will happen is that the first byte transfer gets lost, and this is returned as a "Read Error" by the driver.

For reasons as yet unknown, this "data lost" sequence sometimes "seems" to be driver position dependent. I would guess that most boot failures are caused by this one, especially with older controllers (altho I've seen it happen on newer ones, too). The drivers can be fixed, and we should be able to post patches later.

READS/Writes GO TO WRONG LSN:

Actually, they go to the wrong TRACK, which is also always the wrong LSN. Usually caused by using disk drives that are set to turn on their motors only with drive select, instead of the required method of all motors on with the motor-on signal. All drivers assume that if one motor is on, ALL are on. Because of this assumption, and especially because the drive READY line isn't usually available on the CoCo setup, the FDC will send stepping commands to a drive that is still spinning up again when selected (it takes about 1/2 second to be actually "ready").... and those stepping pulses are totally ignored by drives not spun up. So while the FDC "thinks" it's stepped the head to a new track, in fact either some or all of the step pulses have been lost. Worse, the 1773 FDC seems to ignore the imbedded track information on the disk itself (contrary to docs) and so as long as the sector number matches up, the data is read/written... to whatever track the head happens to be over! So make sure your drive motors all come on at the same time.

SPEED AND BAD CHIPS

Testing and experiences by several people has shown that the American semiconductor industry has gotten pretty bad over the last few years as far as quality goes. Or perhaps retailers are selling more reject chips that they buy on the grey market. In any case, some failures of chips used in add-on devices have been found to be brand dependent. For example, some of the LS245 data buffers inside CoCo-3's seem to fail to pass true data at times. Replacing this chip with a Japanese brand will usually cure this particular problem. Motorola chips seem to be the worst bet. Symptom is that an instruction loop reading from the MPI sometimes sees bits set that it shouldn't. Solution is to replace the chip or slow down the loop. Speedwise, many people use hardware designed and built for 1Mhz operation from the CoCo 1/2 days. A common problem is with RS232 paks... they may need the 6551 replaced with

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a higher speed version.

INTERRUPTS

Root problems also sometimes appear when a device's interrupt line isn't correctly reset. I've had several 6551 ACIAs (used in RS232 paks, etc) that decided not to clear their interrupt line just by resetting the CoCo. This leaves an interrupt hanging and can mess up a machine trying to boot OS-9. It's also been found that some RS232 paks were built with the E clock tied to the IRQ line... this can abort a boot also. Stuck interrupts are covered in the various "IRQ HACK" files available on most networks, as are files on the RS232 pak.

MULTIPAK UPGRADE

A non-upgraded MPI definitely causes problems. At the least, it can cause wrong information to be read from the crucial GIME interrupt status port. The most common rumor we see on BBS's is that the MPI upgrade "isn't needed", because "my machine runs fine without it". DO NOT LISTEN TO THESE PEOPLE. PLEASE EXPLAIN TO THEM THAT THEY ARE STUPID. While we can't swear that you WILL hurt your GIME if you don't upgrade, we can certainly say that it does make electronic sense to DO the upgrade (plus Tandy sold the upgrades at first cheaper than their cost, which alone would make one think there's a good reason for having it, eh?). The electronic reason for the upgrade is this: a READ from \$FF80-9F will turn on BOTH the GIME data bus AND the MPI data bus. (In addition, really old MPIs ghost their slot select at \$FF7F and \$FF9F, which causes problems.) It's never a good idea to have two devices trying to put data on a bus at the same time... one of them could get hurt (usually the GIME, in reported experiences). Especially under OS-9, where the interrupt register at \$FF92 is read at least 60 times a second, it makes sense to not have that data be corrupted by bogus MPI data coming on at the same time. So UPGRADE YOUR MULTIPAK NOW!

E-CLOCK SYNCHRONIZATION:

All accesses to peripherals need to use the 6809 E clock to validate the transfer of data (especially at 2Mhz!). A few early versions of third-party devices accidentally were made with registers that didn't do this. All have been fixed for a year now, as far as I know. The boot-order side of this came about whenever a device register was accessed at an odd/even address, and then the next cpu instruction fetch was at the opposite even/odd address... which meant the A0 address line (or sometimes A1 and maybe A2 also) would change after the E cycle ended and thus cause wrong device register addressing. This was shown on scopes as a small (around 10-ns) glitch. So the *position* of the driver I/O access instructions in memory was very important, and was a true common "boot order" trouble causer (and may still be with older devices made in the pre-CoCo3 days).

GIME S0-3 DECODING

A variation of E-gating is that the SCS external select line is generated inside the CoCo-3 without being E-gated. This could possibly mean that while the GIME is decoding a different I/O selection, the S0-2 GIME lines decoded by the 74LS138 in the CoCo could easily wobble between outputs, possibly randomly enabling ROMs, PIAs, etc and placing bogus data on the bus. It also may be one cause of the video "sparklies". Again, using the E gating on devices should mostly solve this, altho it's also recommended that if you have problems you should gate the 138 with the E clock (Roger Krupski came up with the easiest method: inside the CoCo on the cartridge port, simply tie the E clock to the SLENB line).

DOUBLE INTERRUPTS

This is an oddball one. Sometimes people notice that their boot fails, or that their software clock runs at double speed while within a VDG screen. Quite by accident, I stumbled across evidence that certain address bit combinations in these situations causes double the vertical interrupts to be generated. No solution except to boot to a real window always, and if you have this clock problem to change the order in which you start up a game, so that it's video address can be moved somewhere "safe". This also seems to be GIME dependent. Non-upgraded MPIs can cause this also, I think.

OTHER HARDWARE PROBLEMS

Bad connections. Bad connections. Bad connections. Clean all your contacts regularly. The cartridge port, the MPI and slot pins, all rompak devices, disk drive cables, and even yank your GIME and swab it with alcohol if need

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be, altho sometimes just pushing/tapping on it cures many oddball troubles. Make sure your drives don't have something covering the write-protect detect LEDs. In general, just keep everything clean! It's also about now that many disk drives in use for years, are wearing out or becoming misaligned. Heads become a lot weaker, and data becomes flaky. We've also seen cases where a new cordless phone, or appliance on the same circuit breaker, can screw up floppy or hard disk transfers. Even satellite dish downfeeds running by the computer. If you start to have problems, ask yourself "did anything change here lately?"

OTHER SOFTWARE PROBLEMS

More and more often, we find that many supposed boot list problems often have an unrelated simple explanation... such as making a new boot and forgetting that you patched some modules or used old ones; the common "oops forgot to put Grfdrv and Shell in the CMDS directory" gotcha; leaving out a module. Very often it can be caused by not having the latest drivers for a device. It's important to keep updated with the newest software made available. Also, sometimes a module (especially os9pl) will get hit by an errant program, and then you os9gen a new disk... which gets perpetuated with the bad os9pl from then on through new os9gens. We also find that people often reverify a bad module quite by accident using disk editors on their bootfile, thus hiding future trouble. Keep a log of all changes you make, and CRCs!

MISC THEORIES

Most other problems fall into the mystery section (meaning we don't have a firm handle on the cause yet). I have two pet ideas that may or may not make sense, but which are bolstered in part by experiences by myself and others. One is that since interrupts cause the internal BASIC ROM to turn on (to get the interrupt vectors), the ROM stays on a bit too long and corrupts the data bus at times. Probably a dumb theory (grin). The other is that the dead cycles within many instructions have an effect. During the dead cycle the address bus contains \$FFFF (which turns on the ROM!) and again, 'perhaps this data sticks around, or the address lines change too fast enough once in a while from true address to FFFF. This ties in with partial evidence that some 6809s at 2Mhz will start changing their address lines immediately after the end of an E cycle, perhaps even before E-gated devices finish up. We do know that oddball reads/writes occur at times to strange addresses, and this might explain them. A third theory gaining some acceptance (but we just don't know how the GIME works internally) is that the GIME, like the SAM chip, powers up using either the up or down side of the main oscillator clock (remember hitting reset on SAM machines to get the right red/blue fake color phase? like that). Perhaps one side is better than the other. Certainly powering down sometimes cures a boot or other problem. So who knows? We also know that changing cpu brands, and sometimes switching GIMes, will often cure timing problems and the sparklies. Not always, though.

CONCLUSIONS

We're still gathering data, and occasionally do run across something unexplained. For the most part though, BLOBs have become fairly rare. This may be because people have more L-II experience, or newer hardware, or a combination. OS-9 itself is not at fault, and note that even RSDOS applications can and do suffer from the same symptoms. The basic answer is that we moved up to a faster machine, while still using older peripheral equipment. The order of the bootlist CAN affect the symptoms (as we've seen), but this is simply software showing up hardware bugs, and is NOT the fault of OS-9 itself. So the final word is this: our best evidence is that there really isn't a boot list order bug. Look to your hardware instead. - kevin darling

The above information has been gleaned over the past two years from personal experience, many phone calls and network messages, and the work of Bruce Isted, Tony DiStefano, Chris Burke, Roger Krupski, DP Johnson, Dave Wiens, Ken Schunk, and many others.

This file may be reposted on BBS's and other electronic networks, but may not be used in commercial publications without the author's permission.

PS: if you have anything to add, please send information to me at:

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(Or for Oz OS9 UG, send to Gordon Bentzen, and we will get the message to him ... Ed)

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OS-9 FROM THE BEGINNING - Part 2

This month we continue this series which is aimed at new users of OS-9 and is written around the "standard" modules of the Microware OS-9 operating system distributed by Tandy for the Color Computer 3.

I trust that the comments in last month's article and the "Getting Started" section of the OS-9 manual have resulted in a bootable disk which will fully utilize the capacity of the system hardware. We can now move on to some simple analysis of the operating system and system modules. At the OS9: prompt, try entering "mdir".

"mdir" will produce a directory of all modules currently in memory, and will be similar to the listing below depending on the selections made during the "config" program, and current programmes. The display format will depend on the screen type, 3 columns for 32 or 40 column screens or 5 columns for an 80 column window.

Module Directory at 20:26:35

REL	Root	OS9p1
OS9p2	Init	IOMan
CC3IO	RBF	DD
CC3Disk	D0	D1
SCF	WindInt	Term
W	W1	W2
W3	W4	W5
W6	W7	PRINTER
P	Clock	CC3Go
Pipe	Piper	PipeMan
T2	ACIAPAK	Printerr
GrfDrv	Shell	Copy
Date	DeIniz	Del
Dir	Display	Echo
Iniz	Link	List
Load	MDir	Merge
Mfree	Procs	Rename
Setime	Tmode	

"mdir e" will provide an extended directory with information about each module in memory. Here is a listing of only some of the modules.

Module Directory at 20:57:35

Blk	Ofst	Size	Ty	Rv	At	Uc	Name
3F	D06	12A	C1	1	r	00	REL
3F	E30	1D0	C1	2	r	01	Root
3F	1000	ED9	C0	8	r	00	OS9p1
01	1300	CAE	C0	2	r	01	OS9p2
01	1FAE	2E	C0	1	r	01	Init
01	1FDC	9F3	C1	1	r	01	IOMan
01	29CF	C36	E1	1	r	30	CC3IO

If the listing scrolls off the screen, <CTRL> W will pause the screen (hold down the CTRL key while pressing the W key), hit any key (except BREAK) to resume the listing. Or better yet, enter the command "tmode pause" prior to the "mdir" command. This will cause the list to pause as soon as the screen fills. Hit any key to continue. The command to turn OFF this screen pause is "tmode -pause". Also try other system commands (modules) from the OS-9 Commands Reference section of the manual, like MFree etc.

MULTI-TASKING

The easiest way to see a sample of multi-tasking is to start another "immortal" shell in another window. The default setup of window descriptors can be used to begin with, refer to the manual section WINDOWS, page 1.3, for the default parameters of each window device descriptor. Arg W7 is an 80 column, text type, of 24 lines (a full screen).

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The command at the prompt to start another shell would look like this when typed. `OS9:shell i=/w7& <enter>`
This will startup an immortal shell in window W7 using the default values of window type, colours and size. The ampersand (&) will tell OS9 to run this shell as a concurrent process. Pressing the CLEAR key will switch between the TERM screen and the Window W7. Go to W7 and enter any OS9 command, e.g. `"mdir e"`. OS9 is now multi-tasking. Use the same command `"shell i=/w?&"` (where w? is the number of any valid window device descriptor in memory) to startup another Shell, and enter some commands in each window (CLEAR key to flip between windows). Try the command `"procs"` in one of the windows, and OS9 will report the current processes.

To terminate a SHELL that has been started in a window the command is `"ex"`. This will also close the window.

A window does not need to have a shell running for it to exist. Output of most commands can be re-directed to any valid DEVICE such as disk drive (d0), printer (P), or window (w3).

The command `"mdir e"` redirected to window 6 would be `"mdir e >/w6"`. The listing would be sent to W6. Note however, that in this case the window W6 must not have a shell running. OS9 will redirect the output of the command `"mdir"` to window W6 by opening the window, and display the listing. The window will close again on the completion of the output unless memory has been reserved for that window. The command `"iniz /w6"` will reserve memory and maintain the displayed listing on completion of `"mdir"`.

The opposite of `"iniz"` is `"deiniz"`. The command `"deiniz w6"` will return the reserved memory to OS9 and close the window.

The OS9 manual, "Windows" section, contains all the information on the use of `"wcreate"` or `"display"` to modify the default setup valid window descriptors. The window descriptors can also be configured to a desired display so that repeated modification is not necessary, refer to the article "Windows Explained" by Rob Unsworth in our December 1989 newsletter.

Until next month, have fun with the OS9 level 2 windows and the multi-tasking which we all love.

Gordon Bentzen.

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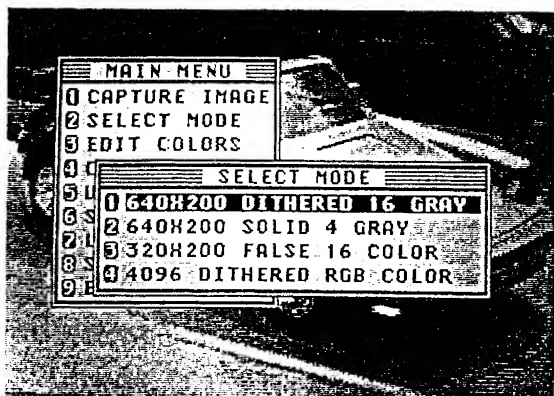
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- * RAS*MAX (Print 4096 colour RASCAN images on CGP-220 & STAR NX-1000)...\$20.00
- * CGP*MAX (Print CM3, GIF, MGE or HSCREEN2 pictures on CGP-220).....\$15.00
- * STAR*MAX (As above but for STAR NX-1000).....AVAILABLE SOON
- * Z'89 (New CoCo3 version of Zaxxon.).....ONLY 5 COPIES LEFT!...\$30.00
- * PYRAMIX (Like arcade Q-BERT.).....ONLY 4 COPIES LEFT!...\$20.00
- * DONUT DILEMMA (10 level platforms game).....SPECIAL...\$6.00
- * RUPERT RYTHYM (16 level strategy/arcade platform game).....SPECIAL...\$6.00
- * SPACE INTRUDERS (an old classic re-vitalised).....SPECIAL...\$6.00

NOTE - ALL PRODUCTS ARE ONLY FOR THE COCO3 WITH DISK DRIVE EXCEPT DONUT DILEMMA (CoCo 1/2/3, disk or tape) AND RUPERT RYTHYM (CoCo 3, disk or tape).

Cheque or postal money order only

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